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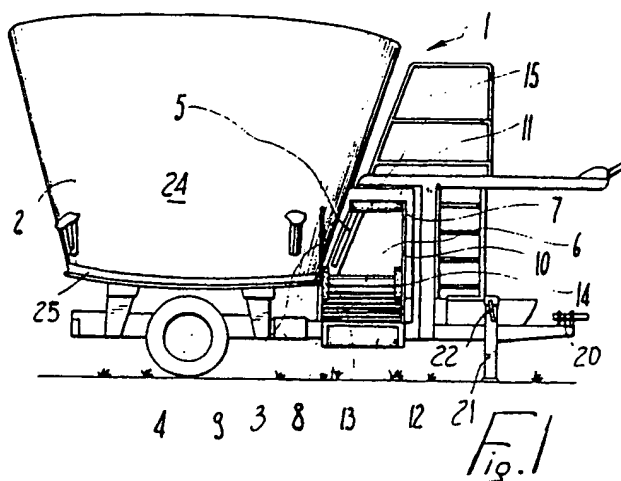
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(54) Apparatus for screening animal fodder products unloaded from mixing trucks.

(57) The apparatus (1) comprises a container (2) mounted on a chassis (3) having wheels (4) and a supporting structure (7). A powered vertical auger is provided inside the container (2) for mixing animal fodder therein. A side wall of the container (2) is provided with an opening which can be selectively closed by a door (5). A conveyor belt (6) having side walls (9, 10) and a lower chute (8) is located adjacent the opening in the container (2), for transporting

fodder therefrom upon opening the door (5). Permanent magnets are fixed to the side walls (9, 10) and lower chute (8) of the conveyor (6) and to a tubular element (11) of the supporting structure (7) arranged above the conveyor (6) for removing and retaining any ferromagnetic material contained in the animal fodder being conveyed.



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APPARATUS FOR SCREENING ANIMAL FODDER PRODUCTS UNLOADED FROM MIXING TRUCKS

The present invention relates to an apparatus for screening animal fodder products unloaded from mixing trucks.

It is known that mixing trucks, in which coarse or fibrous forage, protein and mineral integrators and concentrates such as flours, mashes, pulps etc. are introduced, shredded and mixed, are currently used in the field of zootechnics for feeding animals.

The loaded forage is generally constituted by bales of straw or hay which may contain pieces of iron wires or the like which have been either inadvertently picked up during formation of the bales or separated from any bindings which keep the bales together.

Such pieces of iron constitute a considerable danger for animals, since if they are ingested they can produce considerable damage to the organs of the digestive system and lead to the death of said animals.

The aim of the present invention is to provide an apparatus which can remove any pieces of iron from the fodder loaded by mixing trucks during distribution to the troughs.

A consequent primary object is to provide an apparatus which can be conveniently applied both to mixing trucks which are already in use and to newly manufactured trucks.

Another object is to provide an apparatus which is simple and functional.

Not least object of the invention is to have low costs which can be achieved with conventional production facilities.

This aim, these objects and others which will become apparent hereinafter are achieved by an apparatus for screening animal fodder products unloaded from mixing trucks, as defined in the appended claims.

Further characteristics and advantages of the invention will become apparent from the detailed description of an embodiment thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a side view of a mixing truck on which the apparatus according to the invention is applied;

figure 2 is an enlarged perspective view of the apparatus according to the invention.

With reference to the above figures, a mixing truck for fibrous products is generally indicated by the reference numeral 1 and is substantially constituted by a container 2, which preferably has an annular wall 24 in the shape of an inverted truncated cone. The container 2 is open upwardly and has a base 25, fixed to a chassis 3 with wheels 4,

and to a supporting structure 7 rigidly connected to the chassis 3.

The chassis is advantageously provided with a connector 20 to permit the truck 1 to be towed by a tractor or similar motorized vehicle, and props 21 which can be locked by known per se clamp means 22 in a lowered position (as illustrated in figure 1), to support the chassis 7 in a horizontal position when uncoupled from a towing vehicle.

Said container 2 has, inside it, a mixing device expediently constituted by a substantially vertical worm screw or auger which is not shown in the figures.

Known per se drive means (which are thus not illustrated) are provided. Such drive means may comprise e.g., an electric or hydraulic motor, or an internal combustion engine, and suitable kinematic transmission means such as gearwheels, belts etc.. Obviously, clutch and/or gear devices may be provided for controlling the activation and operating conditions of the mixer. Means for connection to an external power source such as a tractor power drive take-off means may also be provided.

An unloading outlet 23 is provided in the wall 24 of the container 2 and a shutter or door 5 is arranged at said opening 23.

The door 5 may be pivotally or slideably connected to the container 1 or to the supporting structure 7, and remote control means may be provided for selectively opening and closing said door for unloading the mixed products onto a conveyor belt 6 rigidly associated with the supporting structure 7 fixed to the chassis 3.

The conveyor belt advantageously has a lower chute 8 transversely delimited by lateral walls 9, 10, and upwardly delimited by at least one upper member 11, expediently constituted by a tubular element 11 constituting part of the supporting structure 7.

According to the invention, permanent magnets 12, 13, 14 and 15 are applied in the terminal region of said conveyor belt 6 and are advantageously fixed respectively to a lower chute 8, to lateral walls 9 and 10, and to the upper tubular element 11.

Said permanent magnets attract and retain any pieces of iron, wires or similar ferromagnetic material, which may be contained in the mixed product to be distributed to animal feeding troughs.

The animals are thus protected against problems deriving from the possible ingestion of ferromagnetic material which may be present in the mixed fodder.

The permanent magnets, besides being applied on the described type of conveyor belt, can

naturally be applied to conveyor belts with single- or dual-side discharge, or conveniently even to other types of unloading device.

Obviously, the conveyor belt 6 may be provided with independent conveyor-drive means, or transmission means may be provided whereby the conveyor can be powered by the drive/transmission means provided for powering the mixer.

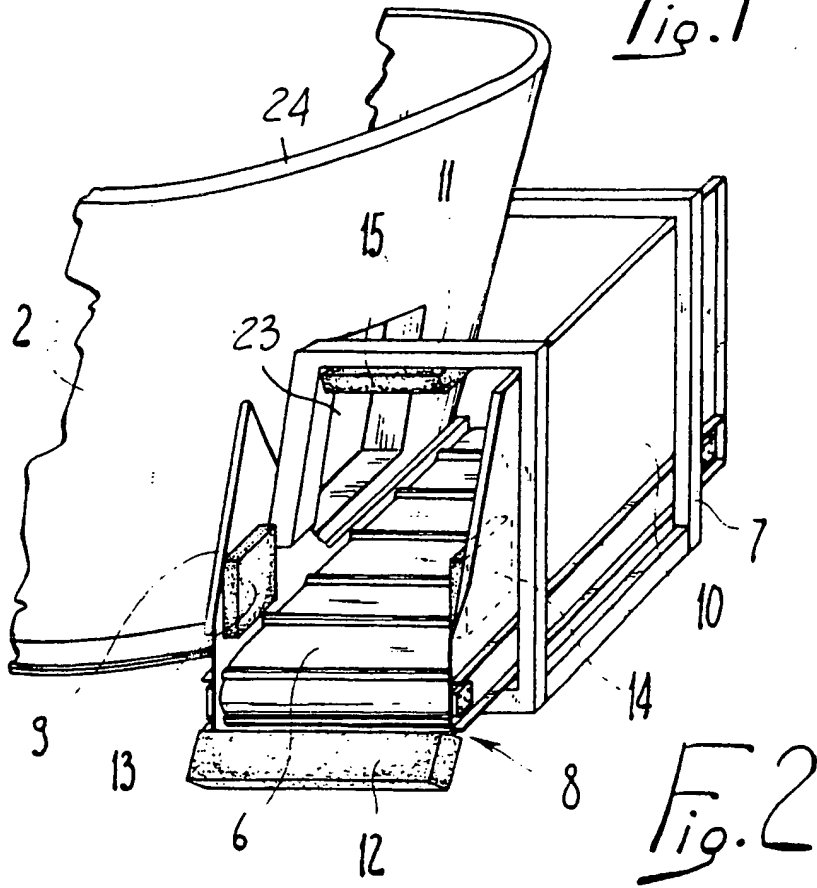
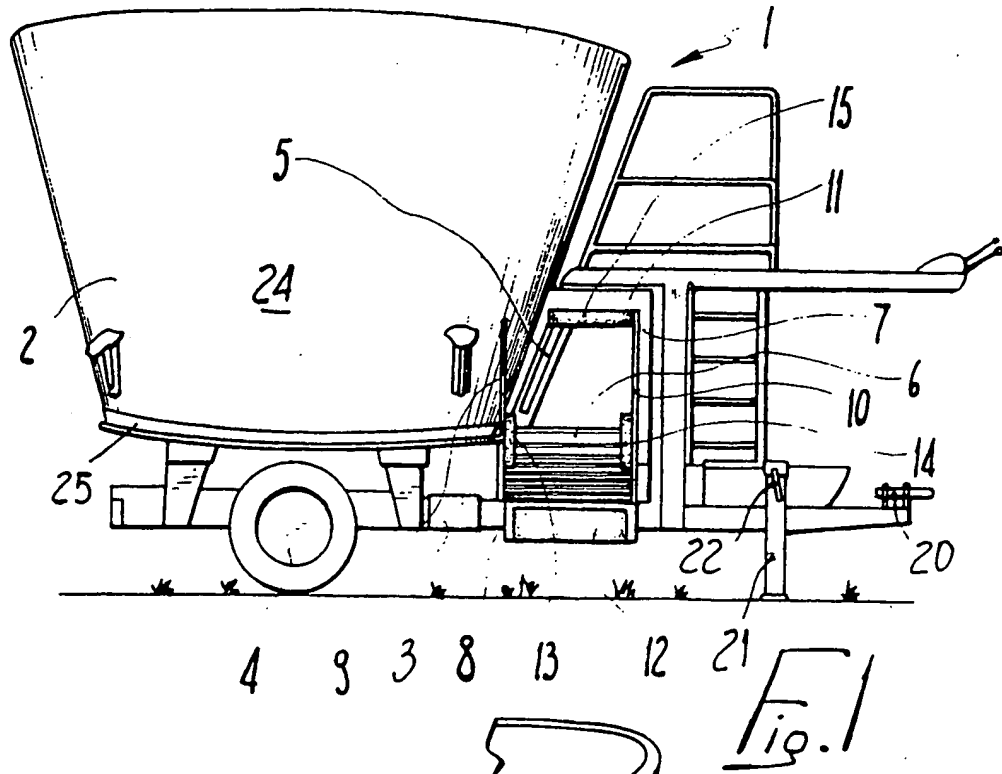
It has thus been observed that the apparatus has achieved the intended aim and objects.

In practice, the materials employed, as well as the dimensions, may be any according to the requirements.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting affect on the scope of each element identified by way of example by such reference signs.

Claims

1. Apparatus (1) for screening animal fodder products unloaded from mixing trucks, characterized in that it comprises at least one permanent magnet (12-15) arranged proximate to regions for unloading said products.
2. Apparatus according to claim 1, characterized in that said permanent magnets (12-15) are arranged on the lower and/or upper and/or lateral regions of said unloading region.
3. Apparatus according to claim 2, characterized in that said permanent magnets (12-15) are applied in the unloading region of a conveyor belt (6) for the distribution of the fodder products at least at one region of the conveyor belt selected from among a lower chute, lateral walls, and an upper transverse element.
4. Apparatus according to claim 1, characterized in that it further comprises a conveyor belt having at least one side discharge.
5. Apparatus for screening animal fodder products comprising at least one container (2) having a substantially annular side wall (24) and a base (25) and being mounted on a chassis (3) having wheels (4), a supporting structure (7) mounted on said chassis (3) adjacent to said container (2), a powered mixing auger provided inside said container (2) for mixing animal fodder therein, at least one opening (23) provided in said annular side wall (24) of said container (2), at least one door (5) for selectively closing said opening (23), at least one conveyor belt (6) located adjacent said opening (23) and having side walls (9, 10) and a lower chute (8) for transporting fodder from said container (2) upon opening said door (5), said supporting structure including at least one element (11) located above said conveyor belt (6), said apparatus further comprising at least one permanent magnet (12, 13, 14, 15) fixed to at least one portion of said apparatus selected from among said side walls (9, 10) of said conveyor belt (6), said lower chute (8) and said element (11) of said supporting structure (7) arranged above said conveyor belt (6), whereby to remove and retain any ferromagnetic material inadvertently contained in animal fodder being conveyed.
6. Apparatus according to claim 5, characterized in that said at least one permanent magnet comprises a plurality of permanent magnets (12, 13, 14, 15) fixed to said side walls (9, 10) of said conveyor belt (6), to said lower chute (8), and to said element (11) of said supporting structure (7) arranged above said conveyor belt (6).
7. Apparatus according to claim 6, characterized in that said conveyor belt (6) has at least one end, and in that said permanent magnet (12) fixed to said lower chute (8) is located substantially at said end of said conveyor belt (6).
8. Apparatus according to claim 6, characterized in that said conveyor belt (6) has a longitudinal extension, and in that permanent magnets (13, 14) fixed to said side walls (9, 10) of said conveyor belt (6) are arranged between a permanent magnet (12) fixed to said lower chute (8) and a permanent magnet (15) fixed to said element (11) of said supporting structure (7) with respect to said longitudinal extension of said conveyor belt (6).





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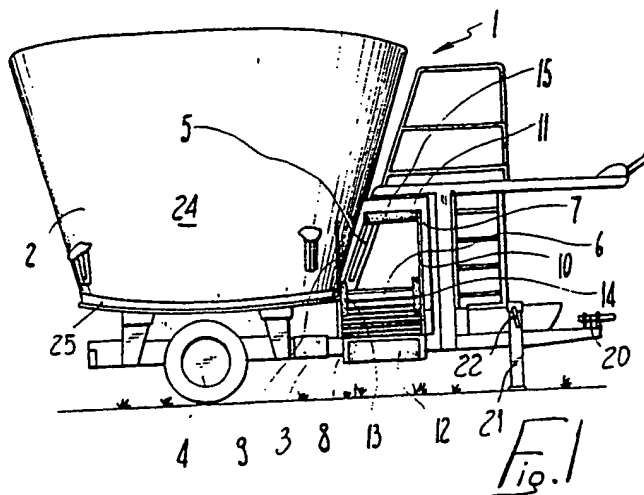
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EUROPEAN SEARCH REPORT

Application Number

EP 90 12 3737

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Y,P	EP-A-0 387 547 (T. FACCIA) * Whole document *	1-6,8	A 01 K 5/00 B 03 C 1/30
Y	DE-A-3 236 121 (J. SPROLL) * Page 9, line 11 - page 13, line 29; abstract; figures 1-2 *	1-6,8	
Y	SU-A-1 498 441 (MOSC. AGRIC. PROD. ENG.) * Abstract; figure 1 *	1-6,8	
A	DE-A-3 009 964 (INSTYTUT METALURGII ZELAZA) * Page 4, paragraph 6 - page 5, paragraph 4; claims 1-2; figures 1-2 *	1-4,7	
A	GB-A-2 139 911 (R. KEENAN et al.) * Abstract; figures 1-2,4-7 *	5	
A	US-A-4 003 502 (E.A. BARCELI) * Column 3, lines 4-33; abstract; figures 1,4 *	5	
A	SU-A-9 597 07 (MOSC. AGRIC. PROD. ENG.) * Abstract; figure 1 *	1-4	
A	DE-A-3 731 653 (J.M. VOITH GmbH) * Column 3, line 47 - column 6, line 35; claim 1; figures 1-5 *	1-4	
A	US-A-3 926 792 (J.P. BUFORD) * Abstract; figures 1-2 *	1-4	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
Place of search		Date of completion of search	Examiner
The Hague		05 August 91	FONTS CAVESTANY A.
CATEGORY OF CITED DOCUMENTS X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons &: member of the same patent family, corresponding document			